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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/593,087

09/15/2006

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L7725.06122

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52989

7590

01/13/2009

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EXAMINER

ALPHONSE, FRITZ

ART UNIT

PAPER NUMBER

2112

MAIL DATE

DELIVERY MODE

01/13/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/593,087	<b>Applicant(s)</b> GOLITSCHKE EDLER VON ELBWART ET AL.	
	<b>Examiner</b> FRITZ ALPHONSE	<b>Art Unit</b> 2112	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 15 September 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 17-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>6, 12</u> . | 6) <input type="checkbox"/> Other: _____  |

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### **DETAILED ACTION**

1. This Office Action is in regard to the Preliminary Amendment filed on 9/15/2006. Claims 1-16 are canceled. Claims 17-31 are pending.

#### ***Information Disclosure Statement***

2. The Information Disclosure Statement (IDS) submitted on 9/15/2006 and 12/15/2006 has been considered by the examiner.

#### ***Specification***

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

#### ***Claim Objections***

4. Claim 31 is objected to because of the following informalities: It is uncertain if the phrase "communication system" has been crossed out on line 3 of the claim. Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 17-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pukkila et al. (Turbo Equalization with Low Complexity Decoder) in view of Bokalamulla et al. (Reduced Complexity Iterative Decoding for Concatenated Coding Schemes).

As to claim 26, Pukkila (figs. 2-4) discloses a decoder for decoding at least one codeword, wherein the at least one codeword has been generated by an encoder comprising a structure providing a code representable by a set of branch transitions in a trellis diagram, the decoder comprising processing unit configured to: initialize a set of branch transition probabilities in the decoder based on the received codeword and the encoder structure; b) initialize a first probability distribution and a second probability distribution according to the initial state of the encoder used to encode the at least one codeword (page 2, column 2, lines 9 to last line); c) recalculate the values of the first probability distribution based on the initial values of the first probability distribution and the set of branch transition probabilities using a recursive algorithm; d) recalculate the values of the second probability distribution based on the initial values of the second probability distribution and the set of branch transition probabilities using a recursive algorithm (page 2, column 2, lines 1 to figure 2); and e) reconstruct a decoded codeword based on the received codeword and an extrinsic probability measure calculated based on the set of branch transition probabilities, the first and the second probability distribution; wherein the processing unit is configured to use in either each of or both steps c) and d) a subset of initial values of the first probability distribution or the second probability distribution, respectively (page 3, columns 1-2).

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Pukkila does not explicitly disclose a subset of the set of branch transition probabilities for recalculating the respective probability distribution, and wherein the values in the subsets fulfill a predetermined reliability criterion. However the limitations are obvious and well known in the art, as evidenced by Bokalamulla (page 3136, paragraph III).

Therefore, it would have been obvious to a person of ordinary skill in the art, at the time of the invention to improve upon the reducing algorithm system, as disclosed by Bokalamulla. By doing so, an algorithm can reduce the complexity by one third with a negligible degradation in error performance.

As to claim 27, the claim differs from claim 26 by the additional limitation “a mobile terminal in a mobile communication system, comprising receiving unit configured to receive at least one codeword, demodulation unit configured to demodulate the at least one received codeword, and a decoder”. However, the limitations are disclosed by Pukkila (figs. 1, 2; abstract).

As to claim 28, the dependent claim 28 included in the statement of rejection but not specifically addressed in the body of the rejection have inherited the deficiencies of the parent claim 27 and have not resolved the deficiencies. Therefore, they are rejected based on the same rationale as applied to the parent claim above.

As to claim 29, the claim differs from claim 26 by the additional limitation “a base station in a mobile communication system, comprising: receiving unit configured to receive at least one codeword, demodulation unit configured to demodulate the at least one received codeword, and a decoder.” However, the limitations are disclosed by Pukkila (figs. 1, 2; abstract).

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As to claims 30-31; the claims have substantially the limitations of claim 26; therefore, they are analyzed as previously discussed in claim 26 above.

As to claim 17, method claim 17 corresponds to apparatus claim 26; therefore, it is analyzed as discussed in claim 26 above.

As to claims 18-19, Pukkila does not explicitly disclose the encoder is representable by a shift register structure containing at least one of feed-forward mathematic operations and feed-back mathematic operations; and, wherein the code is suitable for decoding by employing a maximum a-posteriori algorithm. However, the limitations are obvious and well known in the art, as evidenced by Bokalamulla (fig. 1; page 3135, paragraph II).

Therefore, it would have been obvious to a person of ordinary skill in the art, at the time of the invention to improve upon the reducing algorithm system, as disclosed by Bokalamulla. By doing so, an algorithm can reduce the complexity by one third with a negligible degradation in error performance.

As to claims 20-21, Pukkila discloses using an intrinsic probability measure to initialize a set of branch transition probabilities in the decoder based on the received codeword and the encoder structure; and using an intrinsic probability measure to reconstruct a decoded codeword based on the received codeword and an extrinsic probability measure calculated based on the set of branch transition probabilities, the first and the second probability distribution (page 2, column 2, lines 9 to last line; page 3, columns 1-2).

As to claim 24, Pukkila does not explicitly disclose the reliability criterion is not fulfilled by an element of the first or the second probability distribution, if the signal to noise ratio for the element and/or the absolute value of the element is below a predetermined threshold value.

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However the limitations are obvious and well known in the art, as evidenced by Bokalamulla (page 3135, column 2). See the motivation for the same reason mentioned in claim 17.

As to claims 22-23 and 25, the dependent claims 21-23 and 25 included in the statement of rejection but not specifically addressed in the body of the rejection have inherited the deficiencies of the parent claim 1 and have not resolved the deficiencies. Therefore, they are rejected based on the same rationale as applied to the parent claim above.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fritz Alphonse, whose telephone number is (571) 272-3813. The examiner can normally be reached on M-F, 8:30-6:00, Alt. Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jacques Louis-Jacques, can be reached at (571) 272-6962.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-3824

Information regarding the status of an application may also be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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/FA/

Examiner, Art Unit 2112

January 2, 2009

/Esaw T Abraham/

Primary Examiner, Art Unit 2112